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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/697,725	10/30/2003	Qi Deng	15436.249.40.1	7720

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EXAMINER

THOMAS, BRANDI N

ART UNIT	PAPER NUMBER
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2873

DATE MAILED: 05/10/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/697,725	Applicant(s) DENG ET AL.	
	Examiner Brandi N Thomas	Art Unit 2873	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-8 and 23-28 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☒ Claim(s) 9-22 and 29-32 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input checked="" type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. <u>0401</u> . |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____. | 6) <input checked="" type="checkbox"/> Other: <u>Detailed Action</u> . |

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
 - I. Claims 1-8 and 23-28, drawn to a beam combiner apparatus, classified in class 359, subclass 618.
 - II. Claims 20-22, 29, and 30, drawn to beam combiner apparatus, classified in class 359, subclass 618 and 641.
 - III. Claims 9-19, 31 and 32, drawn to method of combining light beams, classified in class 359, subclass 618.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions I, II and III are related as product and process of use. The inventions can be shown to be distinct if either or both of the following can be shown: (1) the process for using the product as claimed can be practiced with another materially different product or (2) the product as claimed can be used in a materially different process of using that product (MPEP § 806.05(h)). In the instant case the process as claimed can be practiced with another materially different product such as an optical circulator.
3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.
4. During a telephone conversation with Kevin Stinger on 4/14/04 a provisional election was made without traverse to prosecute the invention of I, claims 1-8 and 23-28. Affirmation of this election must be made by applicant in replying to this Office action. Claims 9-22 and 29-31

Art Unit: 2873

withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

5. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Xie et al. (6285499 B1) in view of Au-Yeung et al. (6331912 B1).

Regarding claim 1, Xie et al. discloses, in figure1, a beam combiner device, comprising: a first beam displacer (122); and a second beam displacer (150) coupled to the first beam displacer through a faraday rotator (126B and 146B) to rotate the polarization of an input light beam (col. 6, lines 21-26) but does not disclose a wave plate. Au-Yeung et al. discloses a wave plate to rotate the polarization of an input light beam (col.3, lines 39-41). Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the device of Xie et al. with the waveplate of Au-Yeung et al. for the purpose of

Art Unit: 2873

providing rotating the plane of polarization by 450 in the clockwise direction (col. 3, lines 39-41).

Regarding claim 2, Xie et al. disclose, in figure 1, a beam combiner apparatus, wherein the first beam displacer (122) and the second beam displacer (150) are composed of a birefringent crystal (col. 5, lines 57-59).

Regarding claim 3, Au-Yeung et al. discloses, in figure 3, a beam combiner wherein the wave plate is a half-wave plate (col. 3, line 29).

Regarding claim 4, Xie et al. discloses wherein the faraday rotator includes a garnet stone (col. 12, lines 55-57).

Regarding claim 5, Au-Yeung et al. discloses, in figure 3, a beam combiner wherein the wave plate (16A and 18A) is disposed between the first beam displacer (14A) and the Faraday rotator (20A).

Regarding claim 6, Au-Yeung et al. discloses the claimed invention except for the Faraday rotator is disposed between the first beam displacer and the wave plate. It would have been obvious to position the Faraday rotator between the first beam displacer and the wave plate, since it has been held that rearranging parts of an invention involves only routine skill in the art (In re Japikse, 86 USPQ 70). It would have been obvious to one having ordinary skill in the art at the time the invention was made to position the Faraday rotator between the first beam displacer and the wave plate for the purpose first, rotating the polarized light first and secondly, turning the polarized light beam into two mutually perpendicular polarized beams.

Regarding claim 7, Au-Yeung et al. discloses the claimed invention except for the waveplate including a birefringent crystal. It would have been obvious to have waveplate

Art Unit: 2873

including a birefringent crystal, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use (In re Leshin, 125 USPQ 416). It would have been obvious to one having ordinary skill in the art at the time the invention was made to have a waveplate including a birefringent crystal for the purpose of the anisotropic properties in the birefringent crystal.

Regarding claim 8, Au-Yeung et al. discloses, in figure 3, a beam combiner apparatus wherein both the wave plate and the Faraday rotator rotate the polarization of the input light beam in a first rotation direction when the input light beam is input from a first propagation direction, and wherein the wave plate and Faraday rotator rotate the polarization of the input light beam in a second opposite rotation direction when the input light beam is input from a second propagation direction, the second propagation direction being the reverse of the first propagation direction (col. 3, lines 28-37 and col. 4, lines 37-40).

8. Claims 23-28 rejected under 35 U.S.C. 103(a) as being unpatentable over Au-Yeung et al. (6331912 B1).

Regarding claim 23, Au-Yeung et al. discloses, in figure 3, a beam combiner apparatus, comprising: a first optical fiber (1) coupled to a first lens (12A) that transmits a first polarized light beam (30) along a path in a forward propagation direction (col.3, lines 13-16), a second optical fiber (3); a first birefringent crystal (14A) that is positioned adjacent the first and second lenses and receives the light beams, wherein the first birefringent crystal (14A) transmits the first and second light beams (30A and 30B) in the forward propagation direction (col. 3, lines 17-27); a second birefringent crystal (26) that is positioned to rotate the polarization of the first and

Art Unit: 2873

second light beams received from the first birefringent crystal (14A) and to transmit the first and second light beams (30A and 30B) along the path in the forward propagation direction (col.4, lines 64-67 and col. 4, lines 1-2 and 19-24); a garnet stone (20B) that is positioned to rotate the polarizations of the first and second light beams (30A and 30B) received from the second birefringent crystal (26) and transmit the first and second light beams (30A and 30B) along the path in the forward propagation direction (col. 4, lines 26-29); a third birefringent crystal (14B) that is positioned to combine the first and second light beams (30A and 30B) received from the garnet stone (20B) and transmit the combined light beam in the forward propagation direction (col.4, lines 41-46), and a third lens (12B) that is positioned adjacent the third birefringent crystal (14B) to transmit the combined light beam in the forward propagation into a third optical fiber (2), and wherein a third light beam transmitted through the third optical fiber (2) along a path in a backward propagation direction is transmitted through the beam combiner apparatus such that the third light beam does not enter one of the first and second lens (col. 4, lines 50-56) but does not specifically disclose the a second optical fiber (3) coupled to a second lens and a second light beam transmitted by the second fiber. It would have been obvious to one having ordinary skill in the art to add a lens to the second optical fiber for the purpose of allowing the second optical fiber to transmit a second polarized light beam.

Regarding claim 24, Au-Yeung et al. discloses, in figure 3, a beam combiner apparatus wherein the garnet stone (20B) is adjacent the first birefringent crystal (14A), and the second birefringent (26) is adjacent the third birefringent crystal (14B).

Regarding claim 23, Au-Yeung et al. discloses, in figure 3, a beam combiner apparatus wherein the first light beam (30A) is polarized along a first plane and the second light beam

Art Unit: 2873

(30B) is polarized along a second plane, said second plane being orthogonal to the first plane (col. 3, lines 28-30 and 39-42).

Regarding claim 26, Au-Yeung et al. discloses, in figure 3, a beam combiner apparatus wherein each of the first and second birefringent crystals (14A and 26) has an optical axis of 45° (col. 3, line 29 and col.4, line 24).

Regarding claim 27, Au-Yeung et al. discloses, in figure 3, a beam combiner apparatus wherein the first and third birefringent crystals have the same optical axis (col.3, lines 19-22 and col. 4, lines 44-46).

Regarding claim 28, Au-Yeung et al. discloses, in figure 3, a beam combiner apparatus further comprising: a lens (12A) adjacent the first birefringent crystal (14A) and a lens (12B) adjacent the third birefringent crystal (14B) wherein each lens adjacent the third birefringent crystal (14B) corresponds to the lens adjacent the first birefringent crystal (14A) except for a plurality of lenses adjacent the first birefringent crystal and a plurality of lenses adjacent the third birefringent crystal. It would have been obvious to include a plurality of pairs of lenses adjacent the first birefringent crystal and a plurality of lenses adjacent the third birefringent crystal, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art (St. Regis Paper Co. v. Bemis Co., 193 USPQ 8). It would have been obvious to one having ordinary skill in the art at the time the invention was made to include a plurality of pairs of lenses adjacent the first birefringent crystal and a plurality of lenses adjacent the third birefringent crystal for the purpose of incorporating multiple polarized light beams.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Zhoa et al. (2003/0113055 A1) discloses an improved optical wavelength switches in which no mechanical movement is required to direct optical pathways between plural fiber ports.

Leyva et al. (2002/0181102 A1) discloses an optical signal filter for providing a periodic transfer function in transmitting signals within selected bandwidths.

Xue et al. (6587273 B2) discloses an improved design of beam splitting device that is formed by cutting a birefringent material to predetermined dimensions.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brandi N Thomas whose telephone number is 571-272-2341.

The examiner can normally be reached on 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Georgia Epps can be reached on 571-272-2328. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2873

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



BNT

April 29, 2004



RICKY MACK
PRIMARY EXAMINER